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Making Risk-based Decisions; Deriving Risk-Based Clean Up Goals

Addressing Citizen Concerns With Risk-based Decisions

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(reconstituted and enlarged comments, based on notes)

I'd like to start with a story. Last summer, I attended a meeting where the Wisconsin Division of Health let slip the fact that, based on blood serum samples, the average Wisconsin resident was already three times over the threshold for beginning health effects due to PCBs. These were non-Great Lakes fish-eaters. (The fish-eaters faced even higher risks.)

The next week, when I reported this news to our local science committee (the Science and Technical Advisory Committee for the Lower Fox River and Green Bay Remedial Action Plan), the immediate reaction of one of the Wisconsin DNR staff was, ***"We can't tell the public that. We don't want to alarm the public."***

His reaction was disturbing on several levels:

- **Why did he think the government had the right to withhold this information?** We taxpayers pay dearly to support our government natural resource agencies. We pay for two things: information and protection. We also have a tradition in this country that the government is supposed to share all information it gathers with the public, unless it can prove that releasing the information would create a threat to national security or it is proprietary data that belongs solely to a private party and doesn't concern the public. In this case, it was government-gathered data of strong public interest, but no security threat. It's public property and we have a right to know. We paid for that information.

- **Why did he think it's his job to falsely reassure the public?** That's not what we taxpayers are paying him for. We want the truth --- the complete story. We don't want to be treated like children and fed sugarcoated fiction. Many times, it's more upsetting to learn that the government is suppressing important information than it is to deal with the information itself.

- **His comment implies an insulting, patronizing attitude toward the public.** It's clear that he believes the public is too stupid to respond reasonably. (By the way, anger and outrage are reasonable responses to this particular data.) He fears the public will "over-react" and make irrational decisions. His solution is to prevent any public discussion of the issue. But the healthy, democratic response would be to PROMOTE a public discussion and debate

in open forums, and publicly explore possible solutions to the problem. The public may be ignorant, but it is not stupid (generally speaking.) If the public is given full access to key information, in understandable terms, they will generally support good solutions. At the same time, agencies need to accept the fact that the public may display some raw emotional responses to bad news. These are not polished professional diplomats; these are people who are legitimately concerned about their families' health. They have a right to be "emotional." As Lois Gibbs says, "Polite people are poisoned people."

- **He's shooting himself in the foot.** He's basically a nice guy trying to do his job, but how can he expect to get political support and funding to address the problem, if the public doesn't know there is a problem? How will he get the monitoring, research, education and remediation dollars he needs? I've seen agency staff do this many times on a variety of issues. They complain about their lack of resources and lack of authority to do anything, at the same time they downplay the severity of toxicity problems. It's self-defeating. Politically, we all know the squeaky wheel gets the grease, and an aroused public gets results.

- **Subconsciously, he may have other reasons for not informing the public**. Perhaps he fears that a public outcry might increase his workload. Or maybe he fears that increased PCB awareness might reduce purchases of fishing licenses (which fund his particular branch of DNR.) Or there might be repercussions and accountability within his agency (i.e: "How could the DNR have allowed such widespread PCB contamination?") I've already noticed that government agencies seem to suffer from "media phobia" and like to emphasize success stories and progress, rather than negative issues. It would be far better to acknowledge all fears that might lead to government secrecy, in order to face the perceived problems head on and deal with them, and not give in to the fear. The media should be viewed as a necessary public outreach tool.

Better ways of dealing with the community:

1. **Be honest with the public** --- If we catch you lying to us or manipulating the data, we'll react strongly and you'll lose our trust permanently. Generally, the public blindly trusts the government to protect it, so the trust is yours to lose. But you may also be faced with people who have been badly burned before by a government agency, and you'll have to work especially hard to prove that you're different from their past experience. If you talk with blunt, straight truth and respond to public concerns openly, you should be able to retain trust.

2. **Be respectful of the public** --- Agencies who want successful projects need to address citizen concerns respectfully and completely. Otherwise, you could face expensive, time-consuming and avoidable delays.

a. **Send a "People Person"** --- I've noticed that many technical people do not interact well with the public, which often leads to serious communication problems and loss of trust. Agencies should plan carefully to send a "people person" team to share information with the public and to honestly solicit feedback. Do NOT send an impatient person who thinks the public is an annoyance or "detriment." Local residents will be offended quickly and put up their defenses, making the rest of the process more adversarial. An expensive mistake.

b. **Cut the jargon** --- When interacting with the public, eliminate technical terms and acronyms to the extent possible. Use plain English (and other local languages). Pretend you're speaking to 6th graders. This doesn't mean the public is stupid, only that they can't be expected understand all the details of environmental toxicology. When technical terms are used, the public can react negatively and this reaction could cause serious problems for your project, so it's in your interest to prevent these problems with good communication. Potential results of using jargon:

    i. **Intimidated** --- Local residents may feel inadequate to understand the important issues, leaving them feeling frustrated and left out. This isn't acceptable. No toxicity issue is so complex that the public can't be helped to understand it.
    ii. **Patronized** --- If the information is translated poorly by impatient disrespectful technical staff, the public may feel they're being patronized and react negatively.
    iii. **Distrustful** --- If too much jargon is used, local residents may suspect the agency is trying to "pull a fast one" on them, and become distrustful. Agencies need to make special efforts to respond clearly and openly to public concerns, especially when common sense conflicts with the agencies' scientific findings and decisions.

c. **Listen to public concerns** --- Public consultation should not be an after-thought. It should not be another task to simply do and tick off your list of required steps. It should be an integral leading part of any project affecting the public. Too often we citizens get a strong impression that the agencies and technical people have their minds made up before opening the issue for public involvement. They seem to be doing the public outreach only because it's required by a specific rule, they do the minimum required, and they consider it a waste of their time. As a result, we feel our time is wasted and the impatience of the agencies makes us distrustful. It's not a healthy situation. If agencies try to force their decisions on a public that feels put-upon, it could easily blow up in the agencies' face, leading to political fighting, lawsuits, and expensive delays. In fact, where projects are blocked by citizen lawsuits, it's probably because the agencies neglected their public involvement process

and didn't listen to citizen concerns. An expensive mistake. A smart agency does good citizen outreach, and can anticipate and address problems before they get to the lawsuit stage.

d. **Translate written materials** --- Assessments need to be written in plain English, where possible. Agencies should employ regular non-technical writers to modify reports for readability. Many reports are verbose and could be written using half the words, and half the paper. (Pet peeve: please number the pages with simple whole numbers.) The result will save printing and postage costs, reduce public tension, and smooth the way for better final decisions.

e. **Give us equal time** --- Often, agencies seem too comfortable meeting with the polluters, and barely tolerant or unwilling to meet with local affected residents. As one Wisconsin state official said regarding the Fox River situation, "We're having non-stop daily collaboration" with the paper industries who polluted the river. At the same time, this same official has prevented his department staff from holding hearings and meetings with local citizens on many important occasions. I can't imagine him having "non-stop daily collaboration" with the public. The citizens are shut-out, and the corporations are catered-to. This is not how our American government system is supposed to work.

3. **Safe Means Zero Risk** --- Please don't tell the public it's "safe" to swim in the water or breathe the air, if the risk assessments say otherwise. If the calculated risk is 1-in-a-100,000 for cancer, say so. If the agency has decided that a 1-in-10,000 cancer risk is "acceptable," this is not the same as saying "the agency has determined it is safe." (Remember, taxpayers are not paying you to falsely reassure the public.) And if the non-cancer risks are elevated, it's important to explain these too. I've heard too many agency people minimize the smaller risks (skin contact, inhalation, drinking, etc.) while focusing only on the largest risks (fish-eating). They're ignoring the CUMULATIVE risks of all exposures together, on top of body burdens already over the thresholds for health effects. If a person is already "maxed," additional exposures, even small ones, could put them over the edge into sickness. In addition, it's not enough to protect only "average" people, risk assessors need to fully acknowledge the "unusual" people who have more exposure or are genetically susceptible. These people are valuable too, but too often we see risk assessments protecting to the 95th percentile, as if the remaining 5% of people or wildlife is expendable. This is outrageous. Any compromise calculation of this sort should be spelled out in detail, so the public can understand the "trade-off" being made.

4. **Use Honest Terms** --- Please don't use public relations terminology to hide the impact of agency choices. For example, "monitored natural recovery" on the Fox River and Green Bay is NOT natural and NOT recovery (computer modeling isn't reliable enough to show whether PCBs diminish over time in the Bay and Lake

Michigan --- currently it shows no improvement for 100 years, then the model stops). This used to be called the "no action alternative" which was more honest. Monitoring is not action.

5. **Confront Inaccuracies** --- At many sites, the polluters launch publicity campaigns to mislead and confuse the public. The agencies must spend the time necessary to confront and correct inaccurate information as promptly as possible, to prevent widespread public infection with false ideas. Otherwise, the public may be turned against the agencies' efforts to protect public health. Political compromises may be forced on the agencies.

6. **Don't Expect Enviros to Do the Work** --- Don't assume that environmentalists will do all the dirty work, fight all negative influences and keep the public fully informed. We generally don't have the resources to match the polluters or to do all the needed public outreach. Our budgets and staff are tiny compared to the agencies. We do the best we can, but it's never enough.

Sediment Programs Must Be Fully Funded and Enforced

Citizens across the country are alarmed about the recent sharp cuts in environmental protection, funding and enforcement programs at the federal level. We're very concerned about the 50% cut in the Superfund Program and continued blockage of the chemical feedstock tax surcharge which financed the fund. This money is essential for risk assessments and the engineering details of remediation efforts. Progress will be slowed to a crawl or an absolute freeze if we have to wait for the polluters to donate the money or lose in court. At the same time, the smaller toxic sites must be addressed by additional programs and fully funded, not just the megasites. The loss of government funds makes the site investigations more vulnerable and dependent on biased data generated by the polluters, which is unacceptable. The loss of backup funds also reduces the government's leverage in settlement negotiations, which could result in the loss of hundreds of millions of dollars for remediation and restoration across the country. As the cleanup pace slows, serious public and wildlife health risks will continue.

The Cooperative Approach vs. Law Enforcement

Many workshop participants expressed interest in pursing "innovative, cooperative approaches" or "partnerships" with polluters, as a means of speeding progress or achieving better results.

I would caution against this. I also used to believe in the cooperative approach but learned the hard way it doesn't work. It's politically popular and it sounds logical, but it's a myth. I've served on several community citizen advisory committees, for the Fox River/Green Bay Remedial Action Plan, and for the Menominee River Remedial Action Plan. I've also observed several other collaborative committees, and talked with citizens around the Great Lakes and other parts of the country, where contaminated sediments are

an issue, and our experiences and troubles have been similar. "Cooperative Approach Committees" generally don't work, for several reasons:

- **We're dealing with corporations, not human beings.** While it may sound logical that we could all sit around the table, learn the issues, and reach reasonable solutions together, that's assuming we're all reasonable human beings. The committees operate on the assumption that "if we're nice, they'll do the right thing." But most corporations' prime focus is their bottom line. Corporations may send nice, charming people to represent them on the committees, but these people usually don't make decisions. They're just there to gather information, deflect criticism of their employer, obstruct progress, and use up time. Corporations don't exist to donate their profits to social causes. A typical corporation will not donate millions of dollars to clean up a toxic site, unless it believes it has no other option. Only rarely would public embarrassment or the potential for positive publicity force a company to voluntarily donate, and only when it sees a financial advantage in doing so. (Local family-owned businesses may be more reasonable and human.)

- **Bad track record.** I can name dozens of contaminated sediment sites where collaborative, voluntary citizen committees failed. I can't name even one success story, after more than a decade of collaborative efforts. The Ashtabula River site has been called a success, but it's a weak cleanup, funded largely with public tax-dollars. The polluters escaped accountability. It's not a success if the government is stuck paying to clean-up private liabilities.

- **Processes usually rigged.** Citizens who serve on the committees often discover quickly that the committee was created to serve the host agency's purpose, not to empower the committee. The agencies strictly control the agenda, but give the public impression that the community is being consulted.

- **Clean-up advocates outnumbered.** Generally, only a few token environmentalists or clean-up advocates are invited to participate on large committees of 20-30 people. They are hopelessly outnumbered, put down or out-maneuvered by the rest of the committee, which is usually dominated by corporate or business interests, and weak local politicians.

- **Domesticated enviros preferred.** The agencies tend to invite participants they are comfortable with, rather than true representatives of the public or key interest groups. It's easy to appoint a "nice" person who is honored to have a seat at the table, but who lacks the fire and knowledge of true activists. This could be an expensive mistake: the agencies risk lawsuits from those whose concerns are left out.

- **Unequal resources.** The polluters are usually able to devote more time and technical expertise to the committee than citizen representatives can. Part-time citizens face a major disadvantage. Generally, the only citizens who can

consistently participate are older, retired people, or those with super-flexible work hours. Meetings are usually during weekdays when most local residents have to work, but the industry and government reps can attend and be paid for it.

- **Powerless**. Generally the committees have no funding to pay for assessment or cleanup, and no authority to require the polluters to do anything. The agencies are reduced to begging the polluters for crumbs of support, while using taxdollars for too much of the work. The polluters do their utmost to sustain and encourage the ineffective process, while keeping the committees poor and powerless. Every year of delay means money in the bank for the polluters.

- **Dabbling**. Often, the collaborative meetings are too infrequent to match the urgency of the cleanup need. Years pass while people and wildlife are poisoned. The committee dabbles in the issue, slowly learning the technical details and their role, listening to presentations, setting goals, setting objectives, forming subcommittees, debating workplans, writing proposals, searching for funding, listening to progress reports, and drafting, then redrafting comments. It's endless. Generally, no timeline or deadline is created as a target, so one year drifts into another. The committee stays busy, but gets few tangible results. The public is given the false impression that leaders are working on the problem, so they don't have to get involved.

- **Diversions and Avoidance**. Often, the committees get maneuvered into wasting their precious time on side issues, busywork and fluff projects. Examples: award ceremonies, shoreline litter pick-ups, kids education, information fairs, etc. These are feel-good activities which don't offend anyone and they're cheap for the polluters to sponsor, but they do nothing to remediate the contaminated sediment site. On the Fox River, the committee got diverted to prioritizing non-point pollution, which avoided the controversial sediment problem and allowed the paper mills (which polluted the sediments with PCBs) to blame farmers and urban residents for pollution. (ie: "we're all responsible") The committees are usually dominated by local leaders who don't want to offend powerful friends in industry and business, so they are easily diverted away from controversial actions.

- **Sensitive Agencies.** The committees are also hampered by the natural resistance of the host agency to criticism. Too much time is wasted by agencies trying to explain-away problems or highlight good actions already taken. The committees are generally set up to advise, but the agencies don't really want the advice. Agency staff are often defensive. If agency staff are appointed to facilitate meetings, this sets up a conflict where the facilitator is supposed to objectively and fairly coordinate communication, while at the same time he defends his agency. An impossible task. An impartial mediator is needed, but usually not funded.

- **Consensus decisions.** Too often, the committees reassure themselves that they're arriving "at a fair consensus" when they've deliberately ignored minority opinions from enviros and others by compromising the public interest. In toxicity cases, the victims are usually under-represented, while the polluters have several champions at the table, which is anything but fair. Polluters should have no vote in decisions about cleanup standards and methods, but the consensus process empowers them. By the same token, upstream communities which host the polluters should have no vote regarding cleanup standards. Only the at-risk downstream community should decide. More attention is needed toward victims' rights.

- **Committees are no substitute for public input.** Agencies often cite the existence of a select committee as their surrogate for community participation, but this is not acceptable. True public involvement requires extensive outreach activities: publicly announced and open meetings, workshops, focus groups, surveys, mailings, advertising, individual discussions with a wide variety of civic leaders, interactive websites, listserves, etc. The general public must be involved.

- **Enforcement is the Answer.** We need basic law enforcement, and should stop wasting time and tax-dollars on ineffective "partnerships." On the Fox River, more than 14 years were lost in committee processes, starting in 1986, while 600-1,200 pounds of PCBs flowed down the river into Green Bay and Lake Michigan each year. We made progress only after the federal government stepped in (over the state's objections) with a Natural Resources Damage Assessment, and nomination to the Superfund List. The U.S. Fish & Wildlife Service used millions of federal damage assessment dollars, and the EPA used Superfund to provide $4 million in assessment and planning funds for sediment cleanup. This finally got the ball rolling. A serious THREAT of law enforcement is needed to get the corporations to negotiate in earnest.

Other Key Concerns

Conflicts of Interest It's extremely important to conduct assessments and remediation planning impartially. Checks and balances need to be built in, to protect the technical, regulatory and remediation staff from control or pressure by the polluters. The technical work should be purely scientific, without political influence.

- The polluters must not be allowed to choose the consultants who conduct the sampling and risk assessments. We're seeing too many agency decisions based on data from the polluters. This data has a high risk for bias.

- The polluters must not be allowed to design the assessment or remediation.

- This includes the military and the U.S. Army Corps of Engineers. These agencies operate like large corporations which tend to protect their own projects and budgets, rather than the public's environmental and health interests. The military has a long history of negligence and dishonesty regarding health issues (see the sections on trust above). And the Corps cannot be allowed to assess and regulate their own construction and dredging operations. These are obvious conflicts of interest.

- The polluters may claim their efforts are "science-based" but they always manage to recommend cheaper solutions that are much less protective of public health and wildlife.

- The polluters should be required to immediately fund the sampling and risk assessments necessary to fully evaluate the situation. The money should be relinquished to the agency, who then chooses the consultant or agency to conduct the work. The polluters should have no authority in deciding how the funds are spent.

No secrecy, No surprises --- The public must be consulted and included in all key meetings. For large projects, local governments should hold special elections for citizen delegates to participate in all meetings and negotiations, and report back to the public. The processes need to be open. No backroom dealing.

Explain Unknowns --- I was uncomfortable with the discussion about "margins of uncertainty" and unknowns in risk assessments. I understand that it's possible to calculate boundaries and ranges for parameters which have actually been measured and studied; however, to say that risk assessors can put boundaries around true unknowns is to defy logic. Risk assessors must be careful to explain the distinction to the public, and to admit the limitations to their science. I've spent years listening to toxicologists talk, and I'm always struck by the volume of details they DON'T have data for. Yet they often manage to imply that they are absolutely confident and certain about their conclusions (then they declare the situation "safe.") This is disturbing and, I think, not honest to the public. Most of the subtle health effects of individual chemicals are largely unstudied (effects on the immune system, behavior, reproduction, nervous system, thyroid system, etc.) And the synergistic effects of most chemicals in combination are a permanent mystery. Most field data is on simpler, shorter-lived organisms, which doesn't translate well to higher organisms and humans. I'm not reassured just because water-fleas and minnows seem to survive contact with the sediment or water.

Consistent Standards Needed --- My overwhelming impression from this workshop is one of chaos regarding government ecological risk assessments. It's alarming that the federal government alone has several duplicative research teams and programs, each using different methods and standards (EPA, USFWS, NOAA, USGS, USACOE, and each military branch). And each state apparently has a different program. I did some online sleuthing and found countless duplicative government websites regarding sediment assessment and cleanup. This is confusing to the public, and inefficient and

costly to taxpayers. Many toxic sediment sites are undoubtedly slipping through the cracks, leaving the public and wildlife at risk. The programs should be consolidated in just one or two agencies, standardized and enforced consistently and fairly across the country. This is not the same as saying that all sites should have the same chemical cleanup numerical goal, or get exactly the same remediation method, but the decision-making framework should be standardized and consistently applied.

Release the Dioxin Reassessment. The EPA needs to release the Dioxin Reassessment. We've seen more than 10 years of delay around this important information and it's gotten ridiculous. The reassessment will never be perfect, but enough is known to base actions on. If portions of the assessment are subject to debate, let's have the debate in public, out in the open, so we can see who is making the key arguments. By now, taxpayers have paid millions of dollars for the reassessment, it is public property and we have a right to this information.

The issues are URGENT. Time is not an acceptable treatment method. Remediation must look long-term, but protect existing people also. On the Hudson River, the EPA decision was to allow 67 years to pass before people could eat the fish, when a cleanup alternative was available to do the job in just 11 years, for only $100 million more in cost. On the Fox River, the agencies have also proposed a weak cleanup which waits several decades before protecting the public, when a more immediate cleanup alternative is available, at an incremental cost increase for the major hotspot of only $18 million. (As comparison, the small I live in is taxing itself $300 million to build a luxury football stadium, costing the average family more than $1,000.) These rivers impact some of the most populous regions of the country. On the Fox River and Green Bay, surveys show that 40,000 people eat fish at the 1-in-a-1,000 cancer risk level (and on Lake Michigan proper, thousands more are exposed but uncounted). These are REAL PEOPLE with families and dreams, but because they are anonymous statistics, they don't get the attention they deserve. We don't have dramatic footage of jet planes hitting skyscrapers to mobilize government action, but our issues are no less important. We need to see more appropriate urgency.

Economics --- Contaminated sediment debates usually revolve around the high clean-up costs to the polluters, and the economic burden the cleanup could create for the corporation and community. The corporations usually claim jobs are at stake, terrorizing local workers. The agencies need to do a better job of assessing and explaining the FULL economic costs of the pollution, including a discussion of the medical and lost work potential for people affected by the pollution. If the laws prevent this explanation, then agencies need to recommend that the laws be changed. As it is now, the perpetrators get all the sympathy, while the victims get little or no recognition because they are anonymous. This is an outrage, in many cases.

Prevention opportunities must be assessed at the same time. More than 80,000 chemicals are used regularly in commerce, with new chemicals and combinations introduced frequently. It's not enough to assess existing contamination effects, while ignoring potential new pollutants which may build-up to cause problems in the future. It

doesn't make sense to spend millions to clean-up past mistakes, only to allow recontamination. Prevention, following the precautionary principle, is more cost-effective. New information shows potential problems with pharmeceutical discharges from municipal sewage treatment plants, brominated fire retardants, new persistent herbicides, chlorinated resin acids (from the paper industry), biocides used in many industries, etc. Risk assessments should identify and discuss all new or continuing sources of contamination, to the extent possible, while openly acknowledging unknown factors and effects. Clear and assertive prevention recommendations should be made. (For example, agencies must express support for law changes instituting the "reverse onus" principle, requiring polluters to prove a chemical's complete safety BEFORE they are allowed to discharge it into public waters. The public should not be told all problems are cleaned up or solved, if this isn't the case.

No compromises. The risk assessment should be complete and based on science, not on a political judgment about what will be "realistic" or "good enough." We often get a sense that compromises have been made before the assessment ever reaches the public, which is frustrating. We know that final cleanup decisions will be compromised badly enough and hate to see the basic science compromised also. We don't need two levels of compromise.

Lifting fish advisories is not enough. Most FDA and state fish advisory standards are based on politically adjusted compromises, resulting in so-called "safe" numbers which still allow substantial public health risks. It isn't acceptable to remediate a contaminated site only just enough to meet the fish advisory levels. Even worse would be a decision to leave the contamination in place and only use advisories to warn consumers away. Ecological health and full public health protection must be the target cleanup goals. Full public uses of the resource must be restored.

Aggressive interim actions. While the cleanup is underway, the agencies must conduct aggressive public outreach to at-risk populations to warn them about fish consumption, or other risky contacts with sediment contaminants. The entire exposed population must be informed repeatedly, through direct mail, workshops, door-to-door, school curricula, mass advertising, etc. The polluters should pay for the effort (but not control the message, of course).

Cumulative risks. The U.S. Food Quality Protection Act of 1996 requires cumulative risk assessments which account for multiple source and multiple chemical exposures, to the extent possible. Therefore, a sediment contamination assessment must also factor in skin contact as well as air, land and non-aquatic food exposures, in addition to aquatic food-chain uptake, etc.

Conservative assumptions. Because we all face such a multitude of chemical exposures in our lives, and so many unknowns, it's important to use the most conservative risk assumptions possible. For example: when calculating the risks due to contaminated fish consumption, it's important to assume the least-protective form of food preparation and

consumption, to account for the public's wide range of educational and cultural backgrounds. Many people don't trim the fish; they fry; and some do eat the heads.

Future uses must be assessed. Too often, risk assessments only consider risks due to current uses of the resource. For example, on the Fox River no risk assessment was conducted regarding drinking water, because the river is not used now as a drinking water source (because it's polluted and DNR doesn't designate or protect it from continuing discharges as a drinking water source). In other cases, sediment may not be assessed or cleaned up because the property isn't accessible now for fishing or other uses. This is poor long-range planning and limits the future use of valuable resources. (Green Bay residents may spend more than $150 million to build another 30 mile pipeline to draw water from Lake Michigan, when they could be using local water cheaply instead.) Looking back on the last 150 years, think of the changes. Then look 150 years into the future. We can't predict how we'll need to use the resources then, and for persistent chemicals, future generations may forget where the problems were and start using poisoned areas again, at high risk. ALL potential uses should be assessed, and cleanups should be designed to protect these users.

Remediation must be long-term. Clean-ups must be as permanent as physically possible, to avoid passing our responsibilities to future generations. Upland disposal sites are preferable to confined in-water disposal facilities (CDF's), which are vulnerable dumps guaranteed to fall-apart over time, unless continuous maintenance is conducted forever. By the same token, shallow capping is more vulnerable over time, especially in flowing river situations. It's not enough to say the remediation will work for 50 years. In addition, remediation must not simply move the problem from one site to another. For example: it would be foolhardy to dredge sediments, then landspread them where the contaminants could spread through the terrestrial system and perhaps wash into another waterbody.

Monitoring. Before, during and after the cleanup the site must be monitored to ensure effective remediation. Nearby and downstream sites should also be checked, and cleaned-up immediately if problems are detected.

Improved Surveys Needed. The recently released National Sediment Quality Survey is inadequate. Only 8.8% of U.S. river reaches were included and no data prior to 1990 was used. This recent survey actually found fewer "Areas of Probable Concern" than previous surveys, when this is unjustified based on cleanup rates. A more comprehensive effort is needed to protect public health and wildlife.

Population effects. I was very disturbed to hear of EPA's new policy to evaluate population effects of contaminants, in contrast to the past emphasis on individual effects. This policy has been heavily promoted by polluters in Northeast Wisconsin. They argue that the tumors in walleye and the deformities in the cormorants are irrelevant because the overall populations of both species seem to be stable or growing. This is like saying that it's all right for me to die of cancer as long as I successfully reproduce first. It's a quality of life and security issue. No normal human being would be comfortable

knowing the wildlife around him is cancerous and deformed. Sick wildlife individuals are potential risk indicators for exposed humans. Most people understand this instinctively. Assessments and cleanups must be based on full health protection, including sensitive species and individuals.

Computer projections are a trap. Too often we hear of computer modeling of contaminant dispersal patterns, using time and dilution as methods for achieving target cleanup goals. For most chemicals and situations, this is not appropriate, for several reasons:

- Dispersal simply spreads chemicals to expose more wildlife and humans to health risks over a wider region.

- For some persistent volatile chemicals such as PCBs, the dispersal which eventually protects the source community results in long-range atmospheric transport to expose distant communities in cold or mountainous regions to reconcentrated PCBs. Their distant health risks must be acknowledged and prevented.

- Too often, the computer models are flawed, or based on too little data, and become even more inaccurate the farther they are projected into the future, misleading the agencies and public about long-term consequences of no-action alternatives. Models often involve too many unknowns and unmeasured factors.

- Modeling takes too much time and money, for uncertain results. Many contamination cases are urgent and demand immediate health protection actions, not studies.

- Modeling becomes a source of intense legal wrangling and scientific debate with the polluters. They're difficult to explain to lay judges. A waste of energy for everyone.

- It would be more efficient, timely and cost-effective to set sediment cleanup criteria within generic situation boundaries. Just get the cleanup done.

- If the pollutants being dispersed were coming from a discharge pipe, they would generally be illegal and enforcement actions would require the discharges to stop. An industry dump site in the water should also be considered illegal and require removal to stop discharges to the public's waters. Dispersal of sediment pollutants should be illegal.

Enough is Enough. Assessments can be important and valuable, but too often the polluters seem to use them excessively to create further delays, always demanding more studies, more data, before they will admit the need for a cleanup. Politicians also like to sit the fence and ask for more studies, so they won't have to commit to a controversial action. The agencies need to set clear criteria to help end the research phase as quickly

as possible and start cleanup. It's unacceptable to have years of delay just to study and define precisely how sick we're getting. This is not an academic exercise. Public and wildlife health is at risk.

Conclusion

I'd like to end with another story. On the Fox River, a dredging demonstration project occurred a few years ago where critical mistakes were made. A large hot layer of PCB contaminated sediments was uncovered but not removed, and the state/industry partnership which caused the problem waffled on whether to clean up the mess. Finally, the EPA stepped in, declared the site an "imminent hazard," got a consent decree from Fort James Corporation to fund an emergency cleanup, and in just a few months dredged, treated and disposed of the remaining hotspot sediments. In just one season. EPA showed how quickly the job can be done, if the government takes the health threat seriously. It was great. But the irony of our situation is that the <u>whole</u> river and bay contamination poses a serious health risk, but has only been studied (not cleaned-up) for 30 years now. It's obvious that we need the government to designate and clean up more sites as "imminent hazards" if we really want to protect wildlife and public health.